CRREAT
RESEARCH CENTRE OF COSMIC RAYS AND RADIATION EVENTS IN THE ATMOSPHERE

EUROPEAN UNION
European Structural and Investing Funds
Operational Programme Research, Development and Education

MINISTRY OF EDUCATION, YOUTH AND SPORTS

SPACEDOS
an open-source PIN diode dosimeter for applications in Space

M. Kákona[1,2,*], I. Ambrožová[1], K. O. Inozemtsev[6], O. Ploc[1], R. V. Tolochek[6], L. Sihver[1], O. Velychko[1,2], J. Chroust[5], H. Kitamura[4], S. Kodaira[4], V. A. Shurshakov[6]

1 Nuclear Physics Institute of the Czech Academy of Sciences, Hlavní 130, Husinec, Řež 250 68, Czech Republic
2 Czech Technical University in Prague, Faculty of Nuclear Sciences and Physical Engineering, Břehová 7, Prague 115 19, Czech Republic
3 Czech Technical University in Prague, Faculty of Electrical Engineering, Technická 2, Prague 166 27, Czech Republic
4 National Institutes for Quantum and Radiological Science and Technology, 4-9-1 Anagawa, Inage-ku, Chiba 263-8555, Japan
5 Universal Scientific Technologies Ltd., U Jatek 19/III, Soběslav 392 01, Czech Republic
6 Russian Academy of Sciences, Institute of Medical and Biological Problems, Khoroshevskoe sh. 76a, Moscow 123007, Russia
* martin.kakona@odz.ujf.cas.cz

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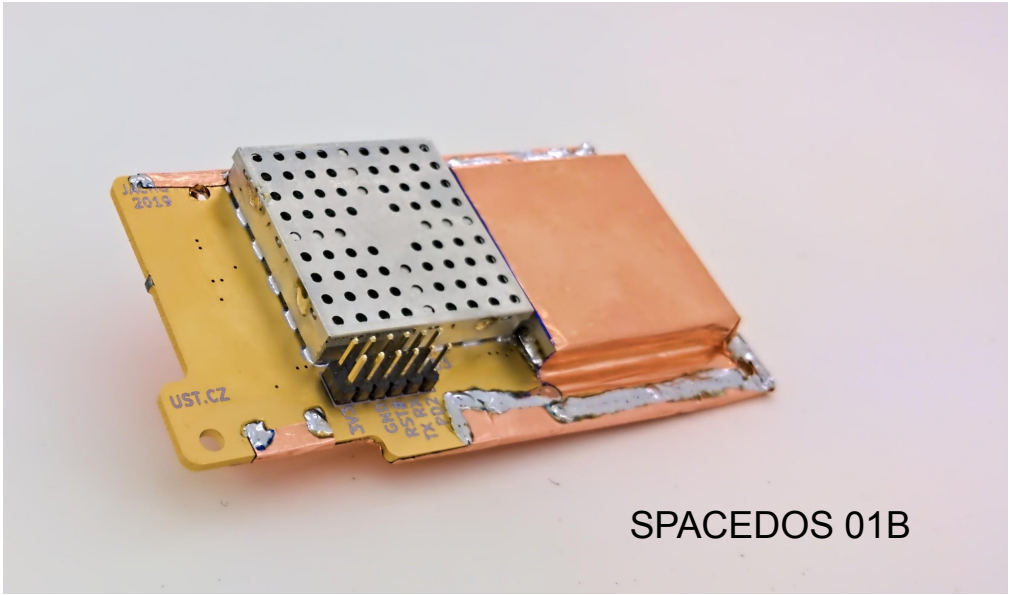
Strategie AV21
Špičkový výzkum ve veřejném zájmu

SPACEDOS



SPACEDOS 01B

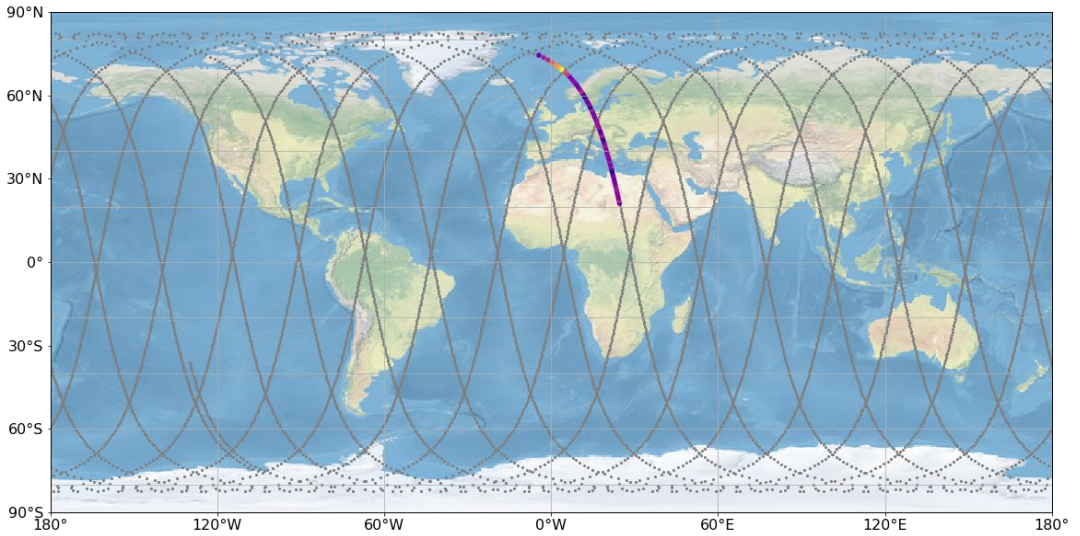
SPACEDOS 02A

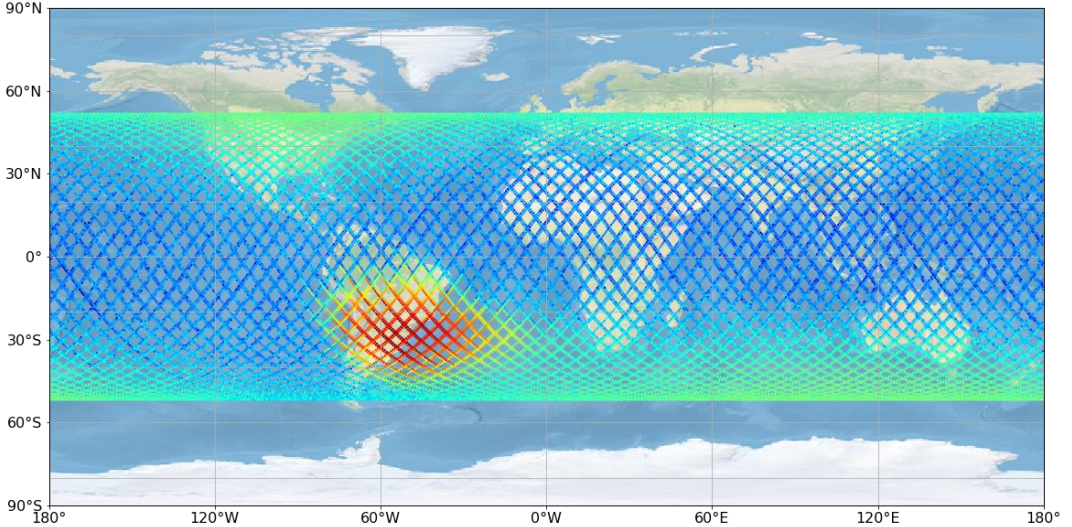
KÁKONA, M, ŠLEGL, J, KYSELOVÁ, D, SOMMER, M, KÁKONA, J, LUŽOVÁ, M, ŠTĚPÁN, V, PLOC, O, KODAIRA, S, CHROUST, J, JOHN, D, AMBROŽOVÁ, I and KRIST, P, 2021. AIRDOS — open-source PIN diode airborne dosimeter. *Journal of Instrumentation*. 1 March 2021. Vol. 16, no. 03, p. T03006. DOI 10.1088/1748-0221/16/03/T03006.

https://github.com/ODZ-UJF-AV-CR/SPACEDOS01

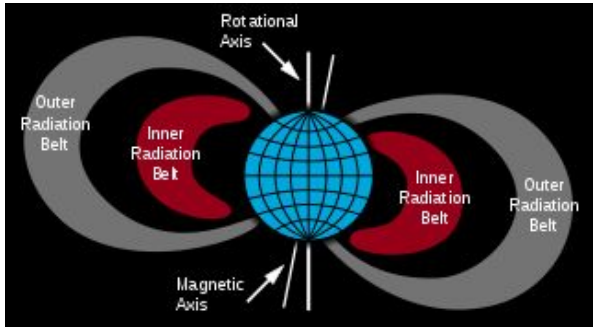
https://github.com/UniversalScientificTechnologies/SPACEDOS02

Missions


90°N
60°N
30°N
0°
30°S
60°S
90°S
180°
120°W
60°W
0°W
60°E
120°E
180°
10^1
Flux [cm^{-2} s^{-1}]

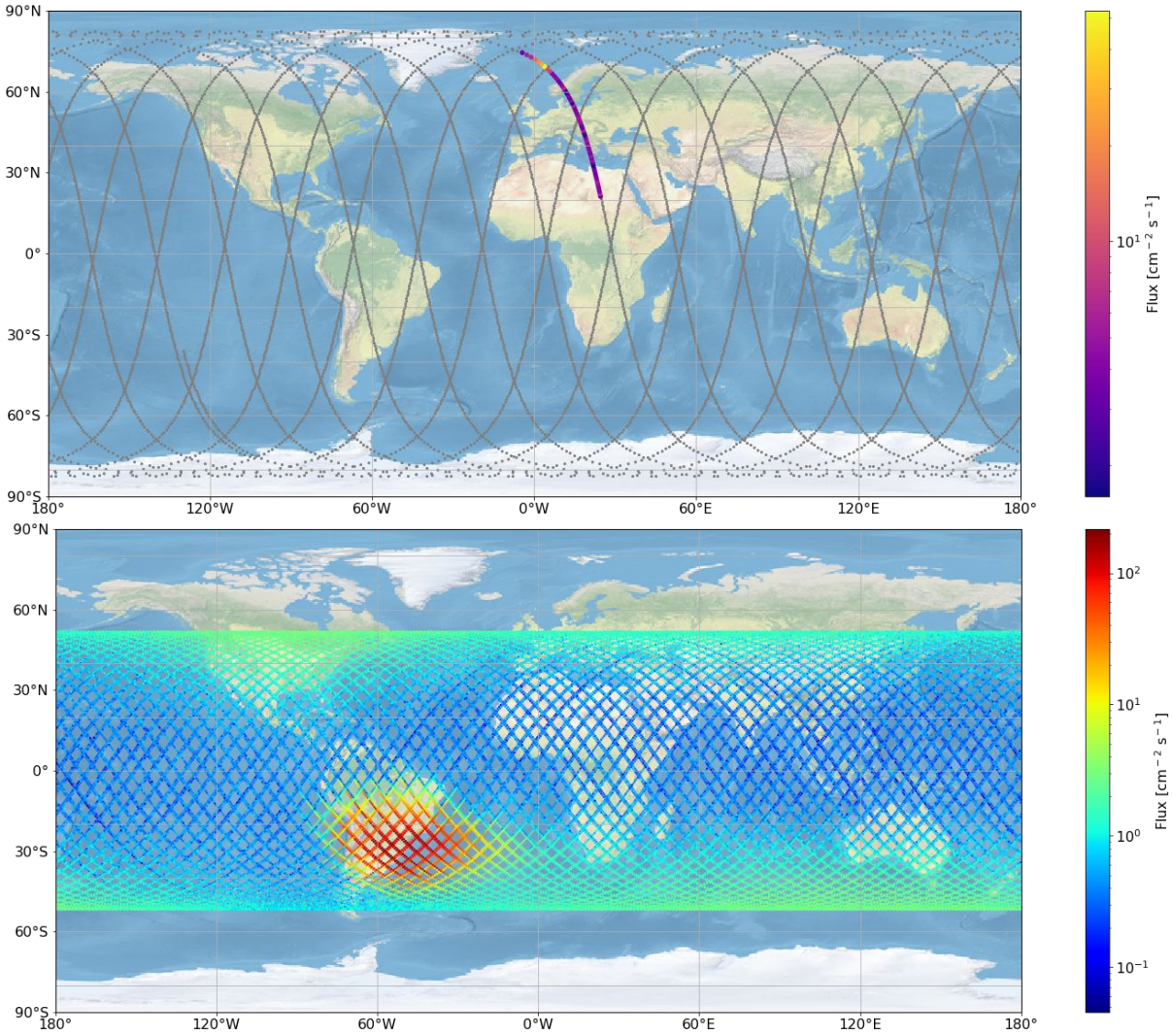

90°N
60°N
30°N
0°
30°S
60°S
90°S
180°
120°W
60°W
0°W
60°E
120°E
180°
10^2
10^1
10^0
10^{-1}
Flux [cm^{-2} s^{-1}]

Missions

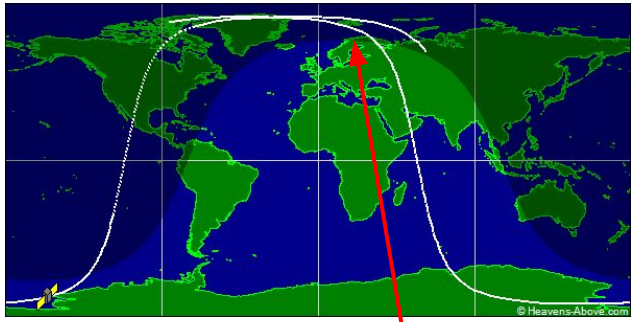


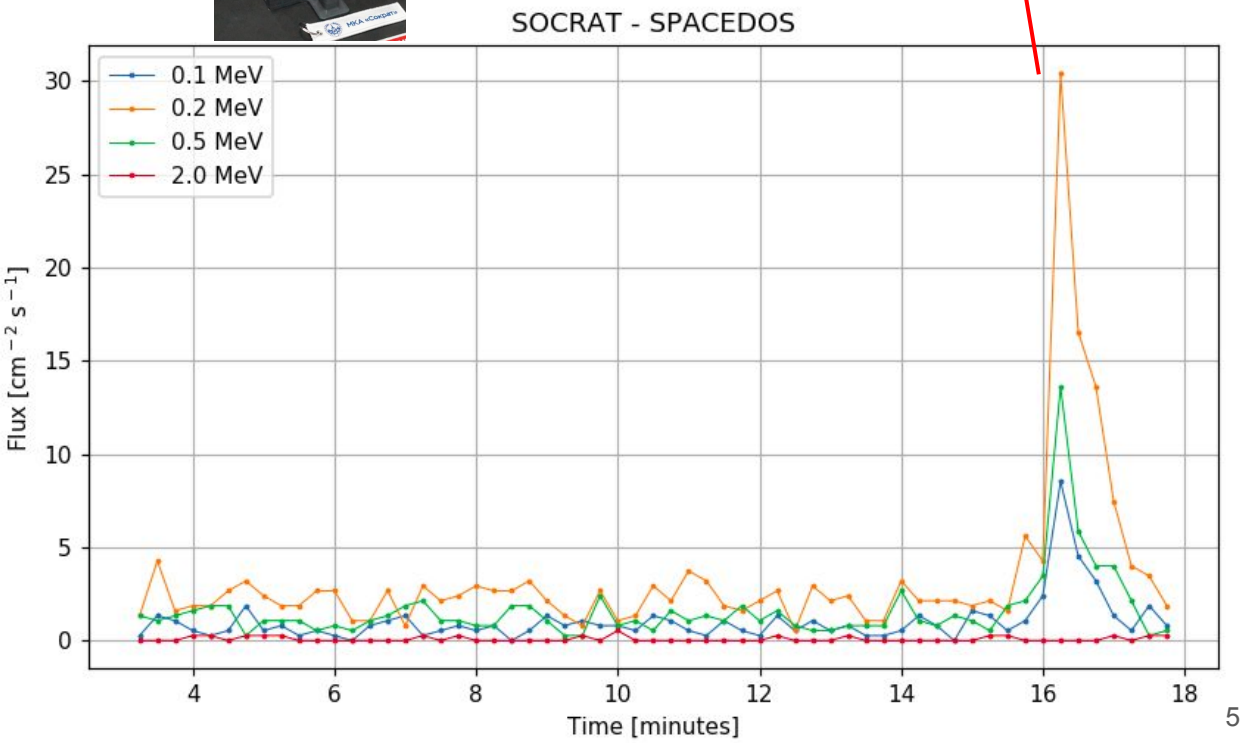
Inner
e^- ~100 keV, p^+ > 100 MeV

Outer
e^- ~10 MeV

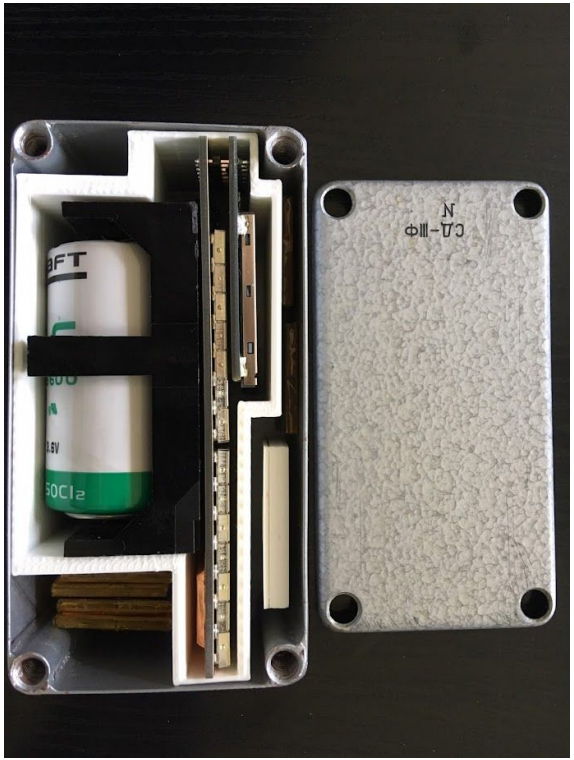


VESMÍR
PRO LIDSTVO





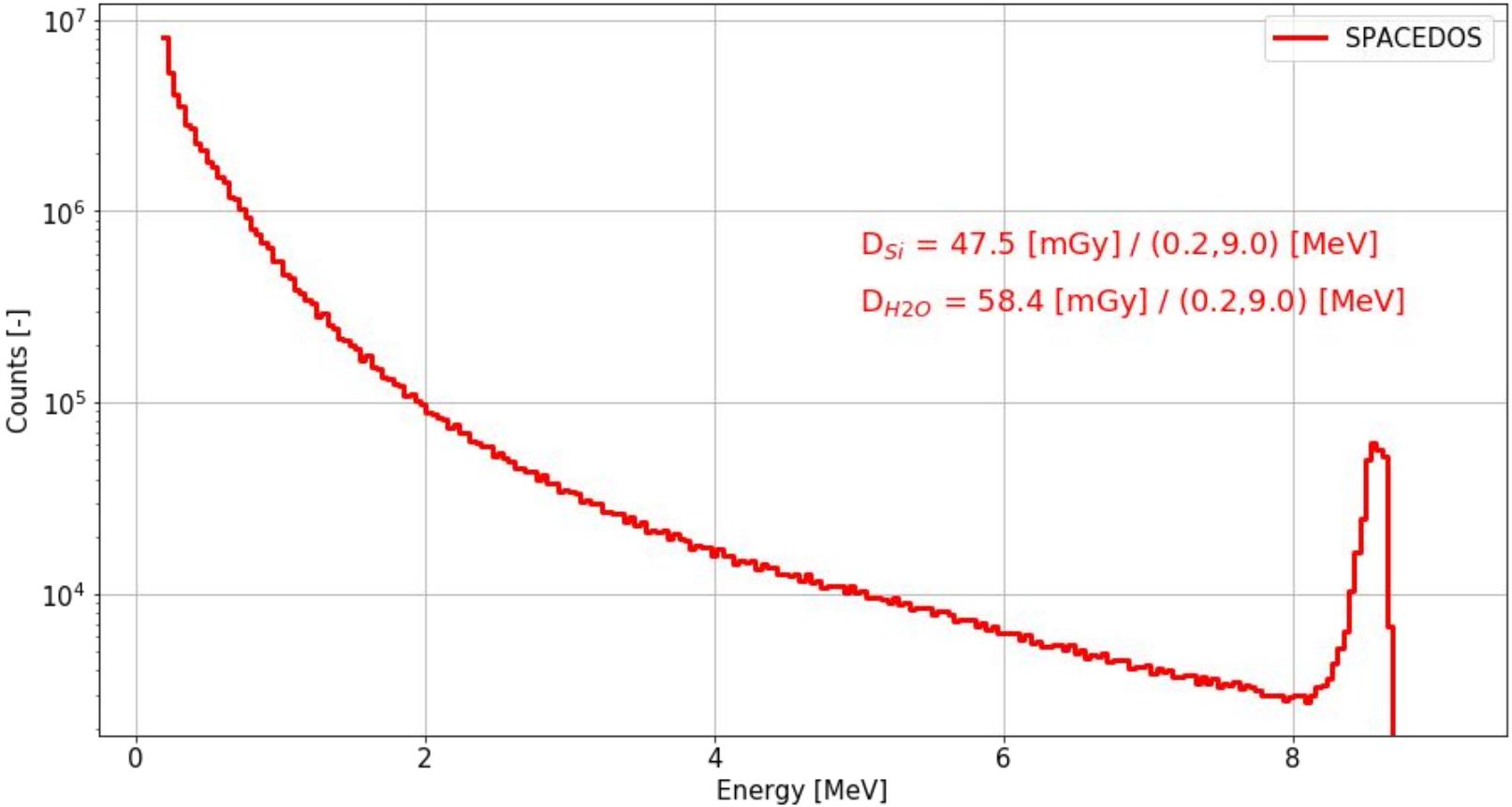
Deployment



Results

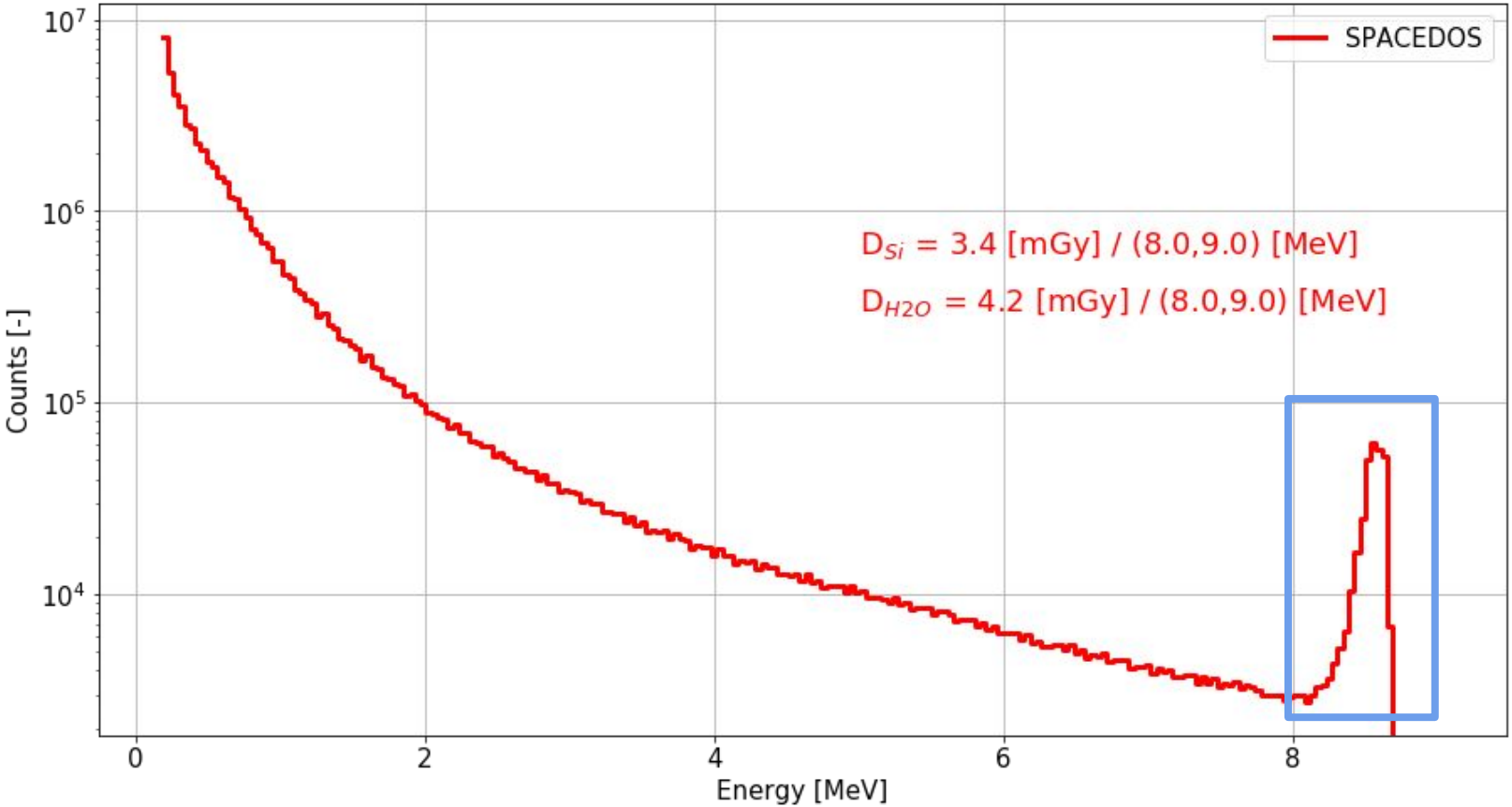
-8.6 %

CaSO4:Dy
65.1 ± 0.4 mGy
(background 1.20 ± 0.05 is not subtracted)



Results

CaSO4:Dy
65.1 ± 0.4 mGy
(background 1.20 ± 0.05 is not subtracted)



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CaSO4:Dy
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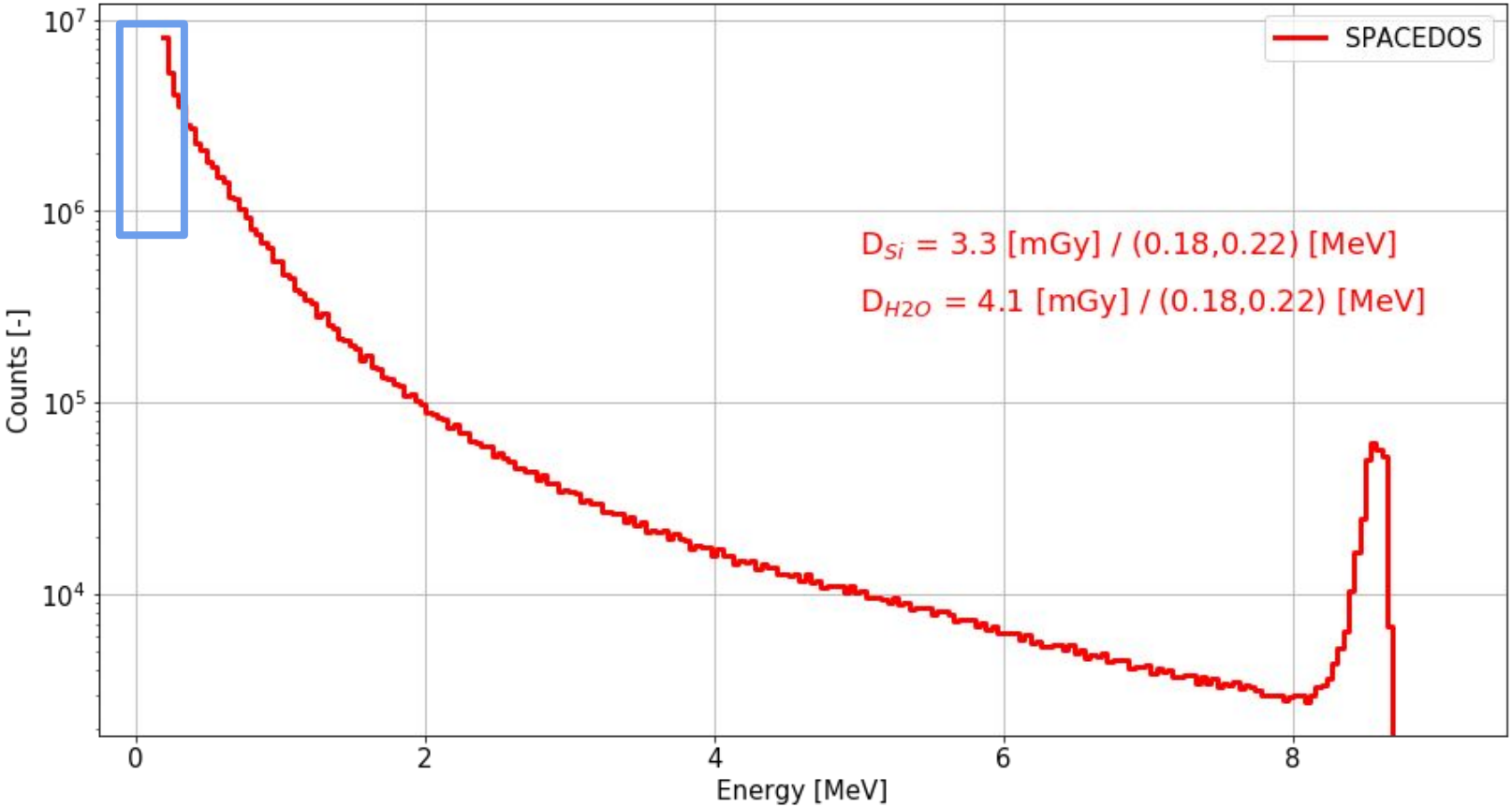
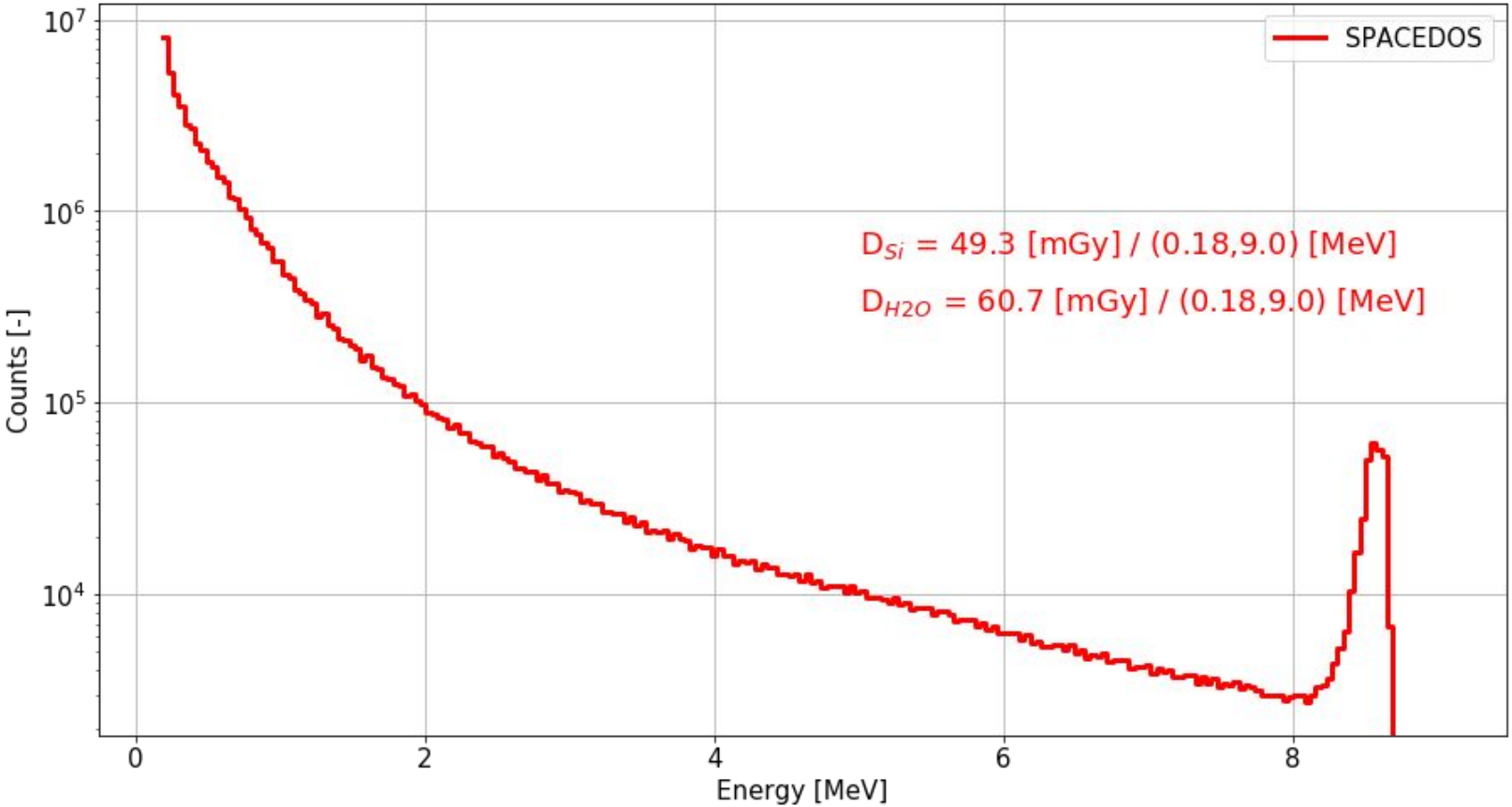


Results

-5.0 %

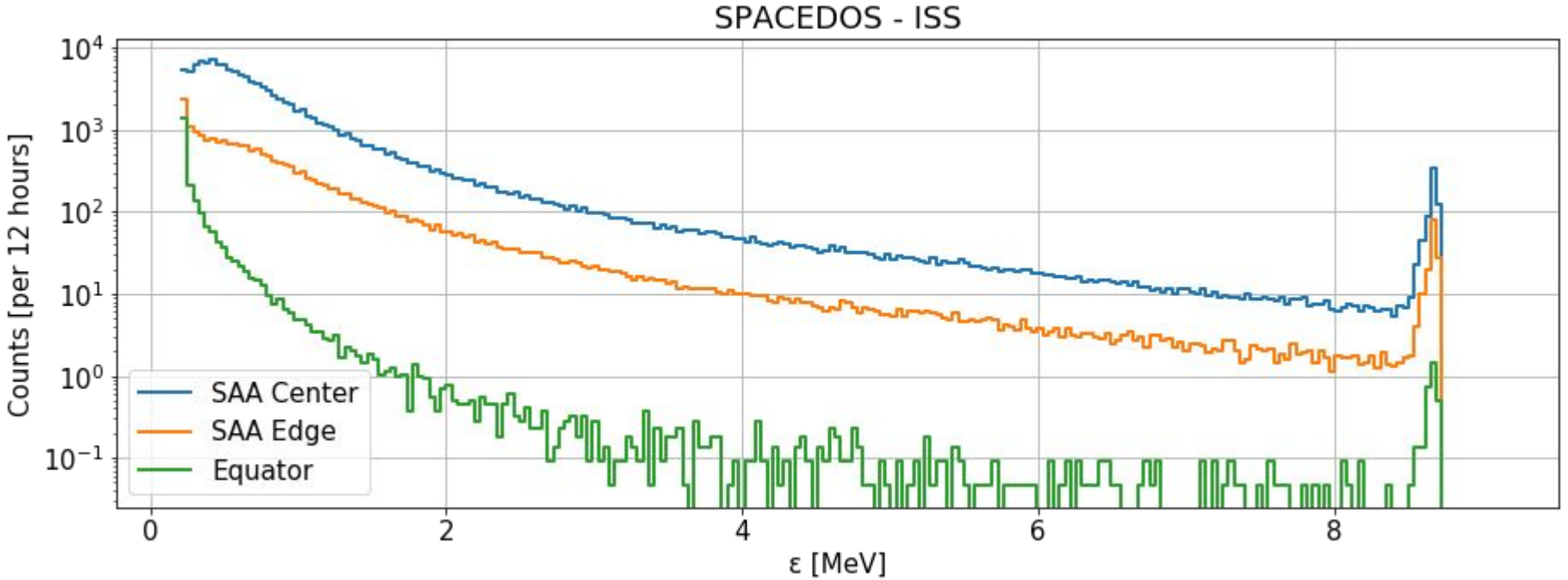
CaSO4:Dy
65.1 ± 0.4 mGy
(background 1.20 ± 0.05 is not subtracted)



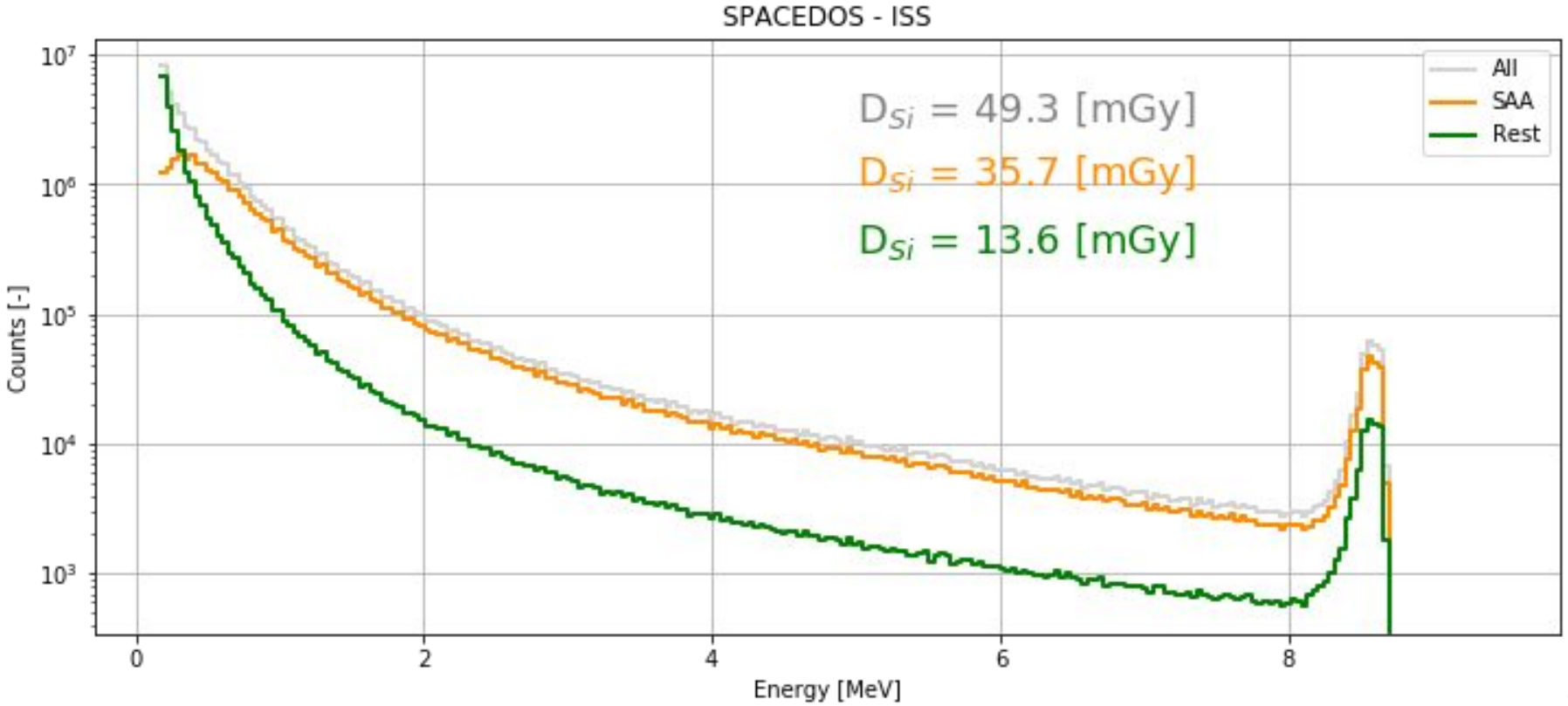
“Low LET particles”

1 more channel ≙ +30 % energy

Spatial Energy Distribution



Equivalent dose



SPACEDOS

SPACEDOS 01 B - vacuum environment

SPACEDOS 02 A - pressurised cabin

- Silicon PIN diode detector (10 mm x 20 mm x 0.3 mm / 5 mm x 5 mm x 0.5 mm)
- Number of energy channels - 240
- Deposited energy range from 200 keV to 8.5 MeV
- Energy measurement resolution < 50 keV/channel
- Power supply 3.3 V / 3 mA (**4 months of operation** on battery)
- Integration time 15 s (customisable in wide range)
- Interface - UART / Industry-grade SLC SD card
- H x W x L - 15 mm x 41 mm x 94 mm (nanosatellite version)
- Weight **130 g** / **33 g**
- **Open-source**